

WHAT IS CLAIMED IS:

1. A method of producing fine-line circuitry on a printed circuit board having a planar surface and at least one filled plated through hole, said method comprising the steps of:
  - (a) drilling at least one hole through a dielectric substrate, said hole defining a surface;
  - (b) depositing a seed layer on planar surface of said dielectric substrate and on said surface defined by said hole;
  - (c) depositing electrically conductive plating on said planar surface of said dielectric substrate and on said surface defined by said hole to form a subcomposite;
  - (d) filling said hole with a filler composition;
  - (e) etching said subcomposite to partially remove said electrically conductive layer to thereby reduce the thickness of said electrically conductive layer;
  - (f) removing residual amounts of said filler composition on said subcomposite;
  - (g) etching said subcomposite to completely remove said electrically conductive layer;
  - (h) depositing a seed activator on the surface of said subcomposite;
  - (i) covering said subcomposite with a photoresist and exposing and developing said photoresist to reveal selected areas of said subcomposite; and
  - (j) additively plating electrical circuitry on said selected areas of said subcomposite.

1           2.    The method of claim 1 wherein said dielectric  
2 subcomposite is an epoxy.

1           3.    The method of claim 1 wherein said etching of said  
2 electrically conductive layer in step (e) reduces the thickness  
3 to a minimum thickness of about 0.2 mil.

1           4.    The method of claim 1 wherein said additive plating  
2 onto said subcomposite produces circuit lines, the thickness and  
3 width of said lines being approximately equal.

1           5.    The method of claim 1 wherein the width of the lines of  
2 said circuitry deposited on said filled plated through hole is  
3 about equal to or less than the diameter of said filled plated  
4 through hole.

1           6.    The method of claim 1 wherein the method further  
2 comprises attaching a component having a pad to said conductive  
3 plating deposited on said filled plated through hole, the  
4 diameter of said pad being approximately the same size or smaller  
5 than said plated through hole.

1           7.    The method of claim 1 further comprising, providing a  
2 photosensitive dielectric layer on said subcomposite, and forming  
3 circuit lines on said photosensitive dielectric material, and  
4 forming vias through said photosensitive dielectric such that  
5 said circuit lines communicate with said fine-line circuitry of  
6 said subcomposite.

1           8.    A method of producing fine-line circuitry on a printed  
2 circuit board having filled plated through holes, said method  
3 comprising the steps of:

- 4 (a) drilling at least one hole through a dielectric  
5 substrate, said hole defining a surface;  
6 (b) depositing electrically conductive plating on planar  
7 surface of said dielectric substrate and on said surface defined  
8 by said hole to form a subcomposite;  
9 (c) filling said hole with a filler composition, said  
10 composition having nubs protruding beyond said planar surface of  
11 said subcomposite;  
12 (d) removing said nubs of said fill composition such that  
13 said planar surface of said subcomposite is nearly smooth;  
14 (e) etching said subcomposite to partially reduce the  
15 thickness of said electrically conductive metal layer;  
16 (f) scrubbing said nubs of fill composition protruding from  
17 said subcomposite;  
18 (g) etching said subcomposite to completely remove said  
19 electrically conductive metal layer of said subcomposite;  
20 (h) depositing a seed activator on said subcomposite;  
21 (i) covering said subcomposite with a coating and exposing  
22 and developing said coating to reveal selected areas of the said  
23 subcomposite;  
24 (j) depositing conductive plating on said exposed areas of  
25 subcomposite to form fine-line circuitry; and  
26 (k) stripping said photoresist.

Sub C1  
1 9. A printed wiring board comprising a dielectric  
2 substrate, at least one filled plated through hole, and circuitry  
3 on said dielectric substrate connecting to said plated through  
4 hole, said circuitry having a line width approximately equal to  
5 or less than the diameter of said filled plated through hole.

1 10. A printed wiring board comprising a dielectric  
2 substrate, at least one filled plated through hole, and circuitry

3 on said dielectric substrate connecting to said plated through  
4 hole, said circuitry having an aspect ratio greater than about  
5 0.5.

1 11. A printed wiring board comprising a dielectric  
2 substrate, at least one filled plated through hole, and circuitry  
3 on said dielectric substrate connecting to said plated through  
4 hole, said circuitry having an aspect ratio greater than about 1.

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